

Information Sheet for Financial Calculus – MATH317

Autumn Session 2006
Wollongong Campus

Subject Coordinator

Assoc. Prof. Song-Ping Zhu (Room 15.G37)
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Phone: (02) 4221 3807
Consultation: **1.30 – 3.30 Wednesday**
1.30 – 3.30 Friday

Subject Prerequisites

MATH202 and either STAT131 or STAT231

This information sheet must be read in conjunction with the general information on educational issues and student matters provided in the document "Policies and Services of the University, Faculty and School" published by the School of Mathematics and Applied Statistics. A copy may be obtained from the subject coordinator or at <http://www.math.uow.edu.au/current/generic.html>.

LECTURER & TUTOR

Assoc. Prof. Songping Zhu (Rm 15.G37)
Phone: (02) 4221 3807
Email: Songping_Zhu@uow.edu.au
Consultation: **1.30–3.30 Wednesday**
1:30–3.30 Friday

REFERENCE BOOKS

Paul Wilmott, Derivatives: The Theory and Practice of Financial Engineering
Wilmott, Howison, Deyenne, The Mathematics of Financial Derivatives, A Student Introduction
John Hull, Options, Futures and Other Derivative Securities

To find other books in the library, use the keywords:

Mathematical Finance, Financial Engineering, Financial Derivatives

SUBJECT LEARNING OUTCOMES

A student who successfully completes this subject should be able to

- explain and apply the mathematical background necessary for pricing options;
- price European and American options by finding analytical and accurate numerical solutions;
- understand the limitations of the Black-Scholes model and be able to improve on various aspects of the model;
- price and hedge options under multidimensional dynamics;
- understand and price many fixed income derivatives using one-factor interest rate models;
- price exotic options such as barrier, Asian and lookback options;

- construct various risk management strategies and determine their limitations.

SUBJECT OUTLINE

This subject introduces the financial calculus and the mathematical and statistical modelling necessary for solving practical problems in three fundamental aspects of financial markets (i) financial assets pricing (ii) financial derivatives pricing and (iii) risk management. The course brings together arbitrage principles, stochastic models of stock prices and interest rates, Ito's Lemma and analytical and numerical techniques for solving partial differential equations, to derive, solve and extend models for the valuation and hedging of a variety of vanilla and exotic options and interest-rate products.

LECTURES

Lecture Monday 09:30-10:30 in 3.123
Lecture Thursday 10:30-11:30 in 15.206

You are required to attend *all lectures* in MATH317. A sign-on sheet will be circulated in a number of lectures throughout the session to monitor attendance. Experience has shown that poor attendance at lectures leads to poor performance in this subject.

Assignments

Students will be given two assignments, in addition to regular homework that should be attempted at home and during the tutorials. The aim of the assignments is to use the knowledge acquired in this course and apply it to practical problems. Students may be required to use computer software such as Maple or Excel. The assessment of these assignments is through two written reports (13% each) and a brief

oral presentation (4%). In the oral presentation, students may choose to present either of their assignments. The 1st assignment will be given after Chapter 3 of the lecture notes and is due on 7 April 2006. The 2nd assignment will be given after Chapter 8 of the lecture notes and is due on 19 May 2006. These assignments will be handed out in class at a time that will be announced in class and through e-mail. You should hand in your report in class or at A/Prof. Song-Ping Zhu's office at or before the due date with a cover sheet.

The receipt printed on the bottom of the assignment sheet will be signed and returned to you by A/Prof. Song-Ping Zhu. Other detailed requirements in terms of length, style and format of the assignment report will be stated on the relevant assignment sheet. You should check your e-mail messages regularly for class announcements as well as for any other relevant issues.

Note: The assignments are only part of the expected workload. Students must do all assigned homework which will be collected but not be marked.

TUTORIALS

Tutorial Monday 10:30-11:30 in 03.123

You are required to attend *all tutorials* in MATH317. A sign-on sheet will be circulated in a number of tutorials throughout the session to monitor attendance. Experience has shown that poor attendance at lectures leads to poor performance in this subject.

During the tutorial sessions, you are required to work on the homework that has been assigned in the previous week and will be assisted with any problems.

ASSESSMENT

The subject is assessed based on the following three components:

Homework and Tutorial	–	5%
Two assignments	–	30%
Final Exam	–	65%

Note: Students have to pass the final exam. (i.e. to have a minimum mark of 45 out of 100 for the final exam.) in order to pass this subject.

GRADES

The approved grades of performance and associated ranges of marks are:

Satisfactory Completion:

High Distinction	85% – 100%
Distinction	75% – 84%

Credit	65% – 74%
Pass	50% – 64%
Pass Conceded	45% – 49%

Unsatisfactory Completion:

Fail	0% – 44%
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Note: A Pass Conceded is acceptable as a pre-requisite, but you may only include a limited number of credit points at the Pass Conceded level in your degree (refer University Calendar).

Scaling of marks is **not** a standard procedure in this subject.

CALCULATORS

Please note that single-line-display calculators are permitted in tests and examinations for this subject. They must not have alphanumeric keyboards (or capabilities) and they must not be programmable in any way. Calculators will be checked in exams and will be confiscated if they have capabilities which are not allowed. If you are not sure whether your calculator is acceptable, have it checked well before any exam.

FINAL EXAMINATION

The final examination in MATH317 will be as follows:

Duration:	2 hours and 15 minutes
Value:	60% of final mark.

#See section on "Grades" above.

The examination will be held during the examination period in November, at a time to be advised by the University. As a student enrolled in the University of Wollongong, you are required to be available for the entire examination period in November.

LATE WORK

Students must hand in their written reports on time. Late submission of reports will result in a penalty of 3% of your mark per late day but is capped at 21% maximum, with no reports admitted after 7 days from the relevant due date.

CONSULTATION

If you are having difficulty with MATH317, you are encouraged to seek advice from the Subject Coordinator. For administrative matters, you should also see the Subject Coordinator.

If you cannot come at the listed consultation times, contact the Subject Coordinator to arrange an appointment at a mutually convenient time.